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ISSUES CONCERNING THE SUSTAINABLE DEVELOPMENT AND USE OF WATER RESOURCES

Human development issues and water resources development in the 1990s

Report of the Secretary-General

SUMMARY

The worsening economic conditions faced by most developing countries since the 1977 United Nations Water Conference, as illustrated by the debt crisis, financial restructuring, world-wide recession and inadequate levels of official development assistance, have exacerbated the water problems faced by the rapidly growing urban and rural populations in those countries. In the face of this population growth and widespread poverty, immediate survival often leads to destructive environmental activities, such as cutting forests for firewood and timber and over-exploitation of both depleting aquifers and nutrient-drained soils. The reduction of poverty is therefore one of the basic conditions for reducing destructive environmental activities and achieving sustainable development.

Following an examination of the economic, social, demographic and environmental dimensions of human development issues and water resources development in the 1990s, the present report formulates a set of proposals for implementing a sustainable water resources development strategy. Particular attention is given to the institutional and financial factors required for the

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implementation of a water resources development strategy that significantly contributes to human welfare and development. The report also stresses the importance of public participation and involvement by local communities as a critical component of water resources planning, development and management, in view of the fact that public participation increases the chances of successful implementation, cost recovery and sustainable operation of water projects.

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INTRODUCTION

1. The 1977 Mar del Plata Action Plan was a major policy statement and framework for action to prevent a global water crisis. Since then, great advances have been made, particularly in the area of drinking water supply as promoted by the International Drinking Water Supply and Sanitation Decade from 1981 to 1990. In the developing countries, more than 1.3 billion people have new or improved water supplies and over 740 million people have improved sanitation. Many more countries are practising effective forms of water conservation and great strides have been made in the expansion and intensification of irrigation.

2. Unfortunately, economic conditions have worsened since the United Nations Water Conference was held. The debt crisis among many developing countries, particularly in Latin America and sub-Saharan Africa, together with resulting financial restructuring, recession, shifts in the terms of trade away from commodities and inadequate levels of official development assistance, have worked to block, slow down or undermine investments in the water sector. In addition, Eastern European investment needs are now competing for the scarce international financial resources available. In their efforts to deal with debt and declining sources of income, much of sub-Saharan Africa and Latin America were net exporters of capital during the 1980s, although there has been a reversal of this situation in a number of Latin American countries, such as Chile and Mexico, during the 1990s.

3. Gains that have been made in areas like drinking water supply have been undermined by rapidly growing and poverty-inflicted populations. Human, industrial and agricultural pressures on water include increasing bacterial and toxic pollution, aquifer depletion, saline intrusion in coastal areas and salinization of soils. The spectre of water scarcity, forecast at Mar del Plata, is starting to become a reality in some regions. Human pressures on the environment produce deforestation, desertification, decreasing biodiversity, ozone depletion and global warming. These conditions reinforce each other in cycles of environmental degradation that have a direct impact on water availability and its use.

4. Properly managed and developed water resources can help in creating the economic, social and environmental conditions necessary to overcome these destructive external forces. Water management is, thus, both a victim of destructive environmental, population and economic forces and an approach for mitigating them. Appropriate water management and development requires technology, financial and human resources, relevant macroeconomic and institutional arrangements, and the political will to make the needed changes. In the water sector, technology is well advanced and is not a barrier to progress, although there is scope for innovations that can lower costs and lead to the appropriate, efficient and environmentally benign use of water. The real barriers are in providing the necessary financial resources under adverse macroeconomic conditions, devising the appropriate institutional arrangements and developing the political will.

5. The present report focuses on some of the key human and institutional factors for implementing environmentally and economically sustainable water resources development. The Mar del Plata Action Plan was a pioneering effort in dealing with the problems of environmentally sustainable and human development, even though the concepts were not fully articulated at that time. The concepts have become much more focused in the past decade through the work of the 1987 World Commission on Environment and Development, the 1992 International Conference on Water and the Environment and the 1992 United Nations Conference on Environment and Development. Consequently, it is time to reassess how these concerns might be better incorporated into strategies for implementing the Mar del Plata Action Plan in the coming decades.

6. The report looks at the developing world rather than at the industrialized countries because that is where the most critical problems of water and human development are found. This emphasis does not imply that the stresses on the environment from the much greater resource exploitation in the North should be ignored, only that the human dimension to development is much more critical where poverty is the fundamental problem.

I. HUMAN RESOURCES CONSIDERATIONS IN THE CONTEXT OF SUSTAINABLE WATER RESOURCES DEVELOPMENT

A. Poverty and the human dimension

7. The World Commission on Environment and Development defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." 1/ If water resources development is to be sustainable, it must engage productively the people it is purported to serve without degrading or depleting the natural resource base in a manner that denies the benefits from its use or enjoyment to future generations. Sustainability of water supply systems must protect and enhance water-related activities and environmental amenities, while maintaining economic viability. 2/

8. People in the developing countries face formidable short-term pressures against the adoption of sustainable practices. In the face of widespread poverty and rapidly rising populations, immediate survival colours all thinking. If survival means cutting forests for firewood and building material, trying to squeeze an extra harvest out of nutrient-drained soils, or withdrawing water from a rapidly depleting aquifer, people will do so even though the resultant degradation will make life more difficult in coming years for them and their children. Economic and political uncertainty also force people to think more about the needs of today than of tomorrow.

9. Any hope of stopping short-term actions destructive to environmental sustainability requires a reduction in poverty. As asserted in Agenda 21, "a specific anti-poverty strategy is therefore one of the basic conditions for ensuring sustainable development". 3/

10. Other elements for achieving sustainable development include a reduction in population growth, a more equitable distribution of resources, a healthier, more educated and better trained people, a decentralized, more participatory government, a more equitable, liberal trading system within and among countries, a better understanding of the diversity of ecosystems and a better monitoring of the environmental impact of development activities.

11. Many of these elements concern developing the human population in a way in which they can successfully break out of the vicious cycles of poverty, population growth and environmental degradation.

12. Human development problems will differ from country to country and from one economic level to another. For many of the poorest countries, however, the preoccupations will be with the denial of choice associated with poverty.

13. While national planning and international assistance efforts have the goal of improving social and economic well-being, there is often a failure between intention and reality. Where planners aim at increasing social and economic benefits to a target population, they may regard the poor as the object of the exercise and not as active agents of change. In human development, people are central and must be treated as the prime actors in ensuring their own livelihood and in taking charge of their future. The institutional mechanisms for including the marginalized poor often do not exist, however, and they themselves generally lack the political power to demand participation when decisions that will affect their future are made. The poor and powerless are the ones forced to resettle to make way for a hydroelectric dam that will generate power for urban areas. In cities, they are the ones who will fail to receive basic water and sewerage if there is competition for scarce resources with wealthier neighbours, who may well be able to finance privately the needed water systems.

14. While the poor as a whole are generally underrepresented in water development planning, women and indigenous groups have even less power and face disproportionate hardship.

15. The role of women in the use and management of natural resources has been neglected by planners and policy makers, despite the importance women have in many of the decisions and activities related to local urban and rural water use, and despite the fact that women suffer the impacts from poverty more directly than men. In national accounting practices, women are overlooked because of their participation in areas in which it is difficult to collect data: small-scale agriculture, the informal sector and household work. Also, much of the water-related household work - carrying water and growing subsistence crops - are unpaid and not counted. Even where women are paid, their earnings are only a small portion of those of men. 4/ It is necessary to gain a better understanding of the real contribution that women make to the urban and rural water economy and ensure that they become full partners in the development process.

16. Indigenous groups have often evolved a harmonious relationship with the natural environment. Many of the estimated 250 million indigenous people living in about 70 countries endow water and land with sacred meanings and see them as fundamental to their understanding of their own existence and identity. The concept of land as something to be bought and sold and used individually, instead of collectively, is alien to them. 5/ Without legal entitlements or means to influence outside actions, they have stood little chance as modern practices have encroached on their lands and waters. They are disregarded and, too late, it becomes apparent that the new uses put to the land cause environmental degradation and destruction of their ways of life. Moreover, the opportunity to understand their sympathetic relationship with the land and waters, and the lessons that can be learned in promoting environmentally sensitive and sustainable development, may be lost. Part of the challenge of human development must be to include these groups in the development process.

17. Water can be used effectively to fulfil certain economic objectives, which nevertheless ignore concurrent human development issues. For example, dams can be built and hydropower generated efficiently to fulfil predetermined technical and economic purposes that do not take account of the social and economic needs for water of the population around the area in which the projects are undertaken. Planners often try to increase economic benefits for urban populations without paying due attention to social returns from development, such as the provision of drinking-water supply, sanitation and small-scale irrigation for the rural poor. There is widespread recognition that for water projects and programmes to succeed in a meaningful sense, the people affected must contribute to and gain from their completion.

18. Water development should be compatible with and complement human and sustainable development. Clearly, much of water resources activity shares the aims of human development. The Mar del Plata Action Plan, for example, is based on the realization that:

> "[...] the accelerated development and orderly administration of water resources constitute a key factor in efforts to improve the economic and social conditions of mankind, especially in the developing countries, and that it will not be possible to ensure a better quality of life and promote human dignity and happiness unless specific and concerted action is taken to find solutions and to apply them at the national, regional and international levels." 6/

19. Most water development activity is directed at establishing conditions for a healthy and productive life through provision of clean water and sanitation projects and other economic projects. The need for knowledge acquisition has been recognized through training and skills development and the building of institutional capability. Water is *par excellence* a resource that can be used by farmers, fishermen, commercial and industrial users and many others as an input for achieving a decent standard of living. Nevertheless, there are still a number of obstacles to integrating human development more fully into the professional and political approaches that drive water development.

20. Water resources development has a history of being an essentially engineering approach. It has been concerned with manipulating water resources to remove constraints on economic growth by supplying water and the services it can provide, or alleviating the unsanitary conditions that threaten public health. As non-structural alternatives may demand exceptional qualities of interpretation, judgement, responsiveness to local views and flexibility, political leaders, planners and donors may opt for an imposed structural supply-oriented development. To assure control, planners may favour projects that have a high technological or engineering component which may not fully involve the people in the development schemes, and may diminish or negate the human development impact.

21. The constraints on development in poorer countries often turn out not to stem from lack of river regulation or contaminated water supplies, but from the socio-economic conditions of the traditional society and the political-institutional weakness of local, regional and national Governments. In other words, technological innovation tends to outpace the social adaptation needed to make the technology a success.

22. A prerequisite to water projects is the social and economic capability to make use of them. Priority must be given to understanding the needs and capabilities of the target populations and providing the education, incentives, backup services, institutional support and financial resources needed to involve the people more effectively in proposed developments.

B. Impact of structural adjustment and macroeconomic policy

23. The large debt load faced by most developing countries has led to the use of structural adjustment and sectoral adjustment loans in which the International Monetary Fund, the World Bank and other international lending institutions impose strict conditions on financial assistance. These conditions focus on promoting exports through devaluation, deregulation of markets, privatization of public entities, easing of import restrictions, reductions in subsidies and other budgetary cutbacks. 7/ Many countries, disillusioned with structural and interventionist policies, are on their own adopting similar market-oriented macroeconomic policies. Some of these reforms aimed at improving efficiency and strengthening institutional capacity can complement reforms needed to give people a greater influence in water management.

24. In particular, reforms to policies that result in distortion of water use deserve careful consideration. For political or strategic reasons, such as food self-sufficiency or industrial policy, Governments may subsidize productive inputs such as water or electricity. For example, in the developing countries, electricity generation is subsidized in the range of 92 to 65 per cent. For irrigation, the effective price charged for water is only about 35 per cent of the average cost of supplying it. 8/ The World Bank has found that only a few countries, for example, Turkey, the Philippines and the Republic of Korea, charge users the full cost or more for electricity and no country charges the full cost for irrigation water. 9/

25. Other distorting policies include price controls on food and use of food aid to maintain low prices. These undercut the costs of local production and give the local farmers little or no incentive to invest in improving crop productivity, through irrigation or other means, or even to stay on the land. Urban populations benefit, but the cost may be the destruction of the rural agricultural economy and increasing urbanization. Removal of such practices must, however, be tempered by consideration of the impact on public welfare to ensure a balance between the need to stimulate the agricultural sector and to maintain affordable food supplies.

26. In a number of cases, the rigorous application of structural adjustment policies on water and human development has been detrimental. Increased exports for commodity-based economies have failed to materialize in the face of barriers to such trade from the developed countries and of a shift in the direction of international trade towards high-technology services and manufactured goods. Devaluation has led to inflation in the cost of necessary imported equipment. Development programmes have been sacrificed to general austerity measures. Maintenance of existing water delivery systems have fallen into disrepair because of lack of funds. Equity has been given little consideration and relative income disparities have widened, with poverty becoming more widespread. Women have borne the greater burden from the reductions in social services, education and health and the removal of subsidies on food. Longer-term investment programmes in water development and environmental sustainability have given way to short-term perspectives and emphasis on financial returns. The priority that should be given to the elimination of poverty and the promotion of human development has been ignored. Since the onset of the debt crisis, many developing countries have become net exporters of capital at a time when they need a net infusion.

27. It is clear that in the examination of structural adjustment and macroeconomic policies, consideration should be given to the specific conditions of each country. Such policies should make available appropriate levels of financial and institutional support for water investments that are essential to achieve basic levels of human health, to meet medium- and long-term development goals and to sustain fragile environmental resources. In general, they should accommodate the need for financial resources to overcome many of the institutional obstacles in the way of engaging people productively in the economy.

II. LOOKING TO THE FUTURE

A. Public participation

28. Public participation is one of the most important aspects of successful and sustainable water development. It is also a critical process in ensuring human development. Participation is necessary for developing consensus and commitment within the local community to make the project or programme work; integrating local values, knowledge and experience into development planning and design; and providing a means of resolving conflicts over resource use.

29. Responding to the needs and interests of the people is the key organizational approach to human development planning, as well as being essential for ensuring success in more traditional-directed planning efforts. The target populations are the ones, and the views of women should be particularly noted, that can decide best on location of facilities, the most appropriate technology for their needs and arrangements for operating and maintaining any systems that are introduced.

30. Local involvement increases the chances of successful implementation, cost recovery and sustainability of projects. The World Bank reviewed 30 of its projects and found an average rate of return of 18 per cent for projects that were considered culturally appropriate and only 9 per cent for projects that did not include mechanisms for social and cultural adaptation. The United States Agency for International Development looked in detail at 52 projects and found strong correlations between participation and project success. The study noted, in particular, success when participation took place through organizations created and managed by the beneficiaries themselves. 10/

31. The practical experience of local people should be a critical component in development planning. Far too many projects have failed to take account of that experience. For example, in Bali, a large internationally financed agricultural project set out to introduce high-input, imported rice varieties. A sudden increase in insect pests and declining crop yields ended the experiment. Subsequently, the project was relaunched, but this time adopting local practice, based on the Balinese irrigation calendar, which made the most of the irrigation water, conserved soil fertility and controlled pests. 11/

32. Development programmes tend to alter the economic and resource use relations of the people in the region because some are in a better position to take advantage of the changes. It is essential, therefore, to establish mechanisms for dispute resolution. Large-scale regional projects, such as river basin developments, need to have local input. Such projects tend to be "top down" in conception and implementation. The local population needs to participate to mitigate the damages and conflict that may arise from forced resettlement or disruption in their traditional agricultural practices.

33. Participation can delay decisions and even lead to projects not going forward. The reluctance to sponsor projects that may be of benefit to society, such as waste sites, is common when a community is asked to bear their costs or risks. To explain and win consensus, often when information is inadequate, and to reconcile competing interests, requires skills not always found in largely technical organizations concerned with water resources. The process can be highly consumptive of staff time. The administrative and organizational burden is heavy, particularly in developing country organizations that may lack sufficient skilled staff.

34. The effort needs to be made. For an irrigation project in the Philippines, for example, it was estimated that the additional cost for

community participation was about US$ 25 a hectare. In return, however, the farmers' local knowledge reduced the costs of construction, with the result that the net increase was reduced to less than US$ 2.50 a hectare, the overall irrigation project was better designed, it had higher user participation and higher revenues. 12/

35. Both Agenda 21 and the report of the International Conference on Water and the Environment stressed the principle of delegating water resources management to the lowest appropriate level. It is clear, however, that a "bottom-up" approach, if left to its own devices, would not be able to respond to all requirements for the sustainable development and management of water resources. There is a need for close interaction between management institutions at the lowest appropriate level and those at the regional and national levels, thus ensuring that adequate support is given to local institutions.

B. Institutional setting and legal arrangements

1. The institutional setting

36. In integrating the human development perspective more fully into water resources planning, the barriers that prevent the poor and marginalized from participating fully in the modern economy need to be removed. An obstacle to using market-based approaches is that without income or capital the poor cannot turn their very real needs for clean water, sanitation, electricity or irrigation water into demands that will be recognized by the market. The most basic task is then to make them effective economic players in their country's economy. This requires efforts at institutional reform, that is, creating the conditions in which participation can take place, such as legal entitlements, proper economic incentives, technical support and training, and participation and representation in the planning decisions.

37. The market is an imperfect mechanism for doing what it does best, that is, promoting economic efficiency, let alone for promoting social equity. Consideration of institutional arrangements needs to take into account the distortions, such as subsidies for resources use, that impair the market economy and the failures of the market and economic analysis to account for important social and environmental factors.

38. Competitive markets do not always allocate resources efficiently or establish prices that reflect true economic, social and environmental values. The hidden contribution of women to the economy, the failure to account for externalities and the resulting environmental and cultural damages to unrepresented groups are seldom taken into account adequately.

39. Water supply, sanitation, wastewater treatment and irrigation water are likely to be under-supplied by the market. Where the service, such as water supply and wastewater treatment, is a natural monopoly, an unregulated private market supplier would restrict the service to raise prices. In other cases,

such as providing storm-water drainage, there is little incentive to supply the service because the cost of excluding users who do not pay is too great. 13/

40. Governments, therefore, have an important role in providing water infrastructure but the intervention needs to be carefully considered. Generally, where the benefit to the user is high, such as for water supply and wastewater collection, there may be little need for government subsidies for investment and operational costs. A study in north-east Thailand showed that willingness to pay was much greater than planners had thought. They had watched their basic hand pump and motor pump/standpipe water supply schemes fall into disrepair. Finally, they learned that the people wanted yard taps. Within five years, 90 per cent of the systems were functioning reliably, 80 per cent of the people were served, meters had been installed, and locally adapted charging systems had been developed. 14/ Where the social benefits to society are greater than to the individual, such as wastewater treatment, Governments may need to subsidize part of the costs.

41. As both the final report of the International Conference on Water and the Environment (A/CONF.151/PC/112, annex II) and chapter 18 of Agenda 21 stress, cost recovery, particularly with regard to ongoing costs, whether collected by the Government through fees or taxes, or user groups, is important. Financial resources are scarce in any country and particularly so in the developing ones. Without income to cover operations, the project is not self-sustaining and must rely on a continuing commitment by Government, which is problematic in the current and immediate future economic climate.

42. Giving greater recognition to human development in water resources planning in the coming decades means changing the status quo. There will need to be a political commitment to social equity and some basic process values to ensure effective involvement by women, traditional subsistence farmers, indigenous people and other groups poorly represented in planning and decision-making. Governments must set in motion the conditions that will enable them to have a voice in the decisions that affect them. Because full participation of underrepresented groups in economic decision-making will lead to policy reform, Governments may face a redistributional backlash from those groups whose privileged economic and political standing will be threatened. Such reform will require a strong political will.

43. Basic institutional reforms will have to be made to permit greater participation by the poor. At a minimum, these arrangements must be responsive to public concerns and interests. They must also ensure the political accountability of political leaders and planners to the public that will be affected by their decisions and actions. There must be opportunity for participation or public input in the planning, implementation and operation of projects and programmes. Above all, to build confidence in the institutions, the institutional arrangements and decision-making processes must be transparent.

44. An examination of the institutional arrangements includes:

(a) The policy elements, including macroeconomic and other national policies that affect water and human development;

(b) The legal regime, which includes water- and land-rights, customary uses, transferability of rights;

(c) Organizational arrangements, i.e., the way Government organizes water policy-making, programming, allocation and management among the local, regional and national levels, as well as providing for public participation;

(d) Programming approaches, which take into consideration the views of local communities.

45. Where actions are taken for social reasons, it is important that they be evaluated against other priorities for use of scarce funds to ensure maximization of social gains.

2. Legal rights and obligations

46. Marginal groups and indigenous peoples may have poorly defined or non-respected rights to the land and water they use to subsist. Without secure tenure, there is little incentive for farmers or urban slum dwellers to make the investments and improvements needed to improve their physical conditions and productive capabilities. Nor will they be willing partners in government development programmes that affect their relationship to the land and water.

47. Thailand offers a positive example of what can be achieved with the assignment of ownership, titles and tenurial rights to land. These changes in recent years have given farmers the incentive to invest in soil conservation and land improvement, with consequent reduction in soil erosion. 15/ With recognized rights to land and water, the holders will have an incentive to make improvements and conserve resources.

48. Communal rights of indigenous groups often go unrecognized and that can have disastrous consequences for those groups and the environment. Governments' development efforts that disregard the traditional rights of these groups will at best engender suspicion and hostility, at worst lead to the destruction of their subsistence economy.

49. Community property systems deserve recognition as they can be highly effective in managing water and related land uses. Such traditional legal arrangements control access and use for irrigation, groundwater, fisheries and other water uses. When Governments are formulating new legal arrangements they should recognize the traditional systems and protect them from encroachment. A legal system that recognizes traditional practices and demands compensation for their elimination is essential to ensure the

progressive integration of indigenous and other common property groups into the development process.

50. Governments, however, need to be aware that, in cases of common ownership, there are incentives for individuals to take too much from the community resource - water extraction, waste discharge - since the cost of their actions is borne by the community as a whole, while they can enjoy full benefit from their socially irresponsible actions. Community systems traditionally have means of regulating internally such activities but in times of economic change or environmental and economic breakdown, destructive individual behaviour may take hold. Governments need to oversee such communal arrangements to ensure equity in the distribution of output of common entitlements and activities, limitations or controls in the disposition of common land and water entitlements, and accountability of managers and representatives.

C. Integrated water resources planning and management

51. Water development encompasses much too broad a range of activities and approaches to allow for categorical generalizations on how planning, implementation and management should be organized. The differences in quantity and distribution of water; level of industrial and agricultural activity; national, regional and local income levels; social, cultural and political conditions; and constitutional arrangements all make it impossible to recommend a single framework for coordinating and planning water development in a manner that encourages human development. Nevertheless, some organizing considerations can be suggested.

52. The institutional framework must represent the interests of all parties affected by water development and management. Mechanisms are essential for coordination of national, sectoral and project agencies. Irrigation, fisheries, river navigation, hydroelectric power, wildlife, and forest management may all be represented by different departments or agencies. In federal States the jurisdictions become more complex since the senior level of government takes responsibility for some water-related sectors and the junior level others. Municipalities add a third tier. Pressures to empower indigenous groups may add another.

53. The watershed is often taken as the ideal boundary for bringing rationality and order to the planning process. The Tennessee Valley Authority (TVA) is the organizational model that has been taken up in a number of river basins, particularly international ones. The river basin or watershed is certainly the basis for carrying out needed planning activities, such as water surveying and water quality monitoring, and the basin is an important natural unit in assessing the environmental impact of projects. But as an organizational model, it has rarely survived the entrenched opposition of strong sectoral departments.

54. The watershed remains the basis for planning and analysis, but the organizational arrangements are destined to remain a complex overlapping set of entities. If organizational complexity is accepted, there must be strong mechanisms for inter-sectoral planning and coordination and a mechanism for water policy-making and monitoring as well as for conflict resolution.

55. Planning and coordination can work at the local level. For example, in Jakarta a number of different agencies were able to implement a relatively successful programme to protect the metropolitan area's ecologically sensitive watershed by shifting growth away from the watershed. 16/

56. Policy on water use should be separated from implementation and delivery. Priorities in the use of resources often become distorted if there is no policy overview from an independent agency to advise on policy and priority setting among competing sectoral water agencies. For example, an agriculture department promoting irrigation could appropriate most of a country's water supply. This appropriation to an essentially low-value water use may block higher-value urban or industrial uses. A policy agency or some other institutional coordinating mechanism should review agricultural needs in relation to other uses to determine use priorities and the allocation of national resources that could be devoted to each sector. Given that water is integral to environmental considerations, water policy-making and monitoring should be done in coordination with the agencies responsible for environmental policy.

57. The formulation of national action plans with the input of local and regional groups could provide a firm basis for the policy agency's continuing role in policy formulation and monitoring of policy implementation. It could make use of local and regional advisory bodies to ensure that local priorities are taken into consideration on an ongoing basis.

58. The line agencies themselves should be organized with input from and, where appropriate, operation by local user groups. The decentralization of line departments and the devolution of responsibilities to outside organizations and groups will differ in accordance with conditions and readiness for full participation of those groups. They may need strengthening through technical assistance, management training and gradually increased levels of responsibility. The most effective user groups are the ones that reflect their society and enjoy widespread local support.

59. There may well be equity considerations in devolving responsibilities to local groups. For example, the contribution of women to all facets of water sector activities should be accounted for in local groups. Similarly, devolution should not reinforce local disparities and social inequities by giving unrepresentative authority to certain local privileged elites.

60. The use of local volunteer organizations and non-governmental organizations offers a means to work effectively at the local level. They may be more flexible and able to function better than state agencies in remote areas, deliver low-cost appropriate technologies and involve the people more

directly. They also can have an important feedback function by reporting on the way programmes and agencies are operating at the local level.

61. Devolving services encourages the use of local resources and may reduce administrative costs. On the other hand, it makes it more difficult to achieve national standards and may reinforce disparities between regions.

62. There is a need for Governments to reconcile conflicting demands emerging from the public with national water, environmental, fiscal and sectoral priorities. One way is to develop a national water or environmental plan that incorporates the views of all people and agencies that would be essential to implement it. Canada successfully developed a National Water Policy on the basis of widespread consultation by an independent commission. The World Bank comments on the consultative experience in developing a national environmental action plan in Burkina Faso as follows:

> "Although it might have been quicker and cheaper to produce the plan using international consultants, the plan would not have been a Burkinabe product and would probably have joined other 'external' products on a bookshelf instead of resulting in action." 17/

63. Such action plans can serve as an effective vehicle for assigning water use and development priorities; identifying financing, skills and technology gaps; and serving as a framework for negotiating with international and bilateral lending agencies the allocation of development assistance. Since water is so intimately connected with environmental considerations, such plans should be developed in conjunction with efforts to develop national sustainable development strategies.

64. Water development is directed at supplying water for drinking, industrial use or irrigation. It may also solve flooding, water pollution or other water-related problems. Finally, development may take advantage of an opportunity such as a dam site for hydroelectric power development. 18/ Although neglected in the past, water planning should take fully into account that water is central to ecological systems and in its natural state is vital to the preservation of wetlands, other environmental and amenity values and traditional lifestyles.

65. An underlying consideration for both efficiency and equity concerns will be the provision of good information. Monitoring and evaluation information is critical in effective water management. The line agencies should be able to monitor local progress and feed information back to headquarters and the policy-making agency. Governments and the public will need information on emerging problems and opportunities, the nature of the problems, the options for solving them, the costs and benefits and how they will be distributed, and an evaluation of the progress being made.

III. CONCLUSIONS AND RECOMMENDATIONS

66. The challenge is to implement water development in a manner that contributes to human welfare and development. When broader social goals are sought, success in supplying water and success in promoting human development are interdependent. Quite simply, the recipients of the benefits of water development and those delivering them must have the means to sustain that development.

67. The mixed success of much water development lies in the fact that people lack the incentives and means to sustain it. Poor and often unable to influence political and planning decisions, they face major sets of obstacles that hinder making the water projects a self-sustaining success and effecting the socioeconomic transformation to allow them to participate effectively in the modern economy. Circumstances vary from region to region, but the obstacles they face may be inadequate information, skills, capital, economic incentives and institutional support to participate and take advantage of development opportunities.

68. The world's poor are marginalized and do not effectively participate in the processes that are supposed to better their lives. Since water is a resource of value, there will be competition and conflict over who will claim the benefit from its use. The poor, however, can seldom make their voices heard and their needs will be neglected or misrepresented.

69. To integrate human development into water resources development requires a shift in thinking. Instead of doing for and to people, there must be a recognition that the people will be the ones doing for themselves. Development planning then becomes a process of responding to their needs and helping them live up to their potential to better their economic and social conditions.

70. The shift in thinking is not so much with regard to objectives as with the process and approach. Human development is people centred, a "bottom-up" approach founded on a strong ethical base of equity and participation. It approaches development as a process, which can be sustained only through the involvement of the people most directly affected. It is inclusive, drawing in women, indigenous groups and more generally the rural and urban poor who are too often excluded from development programmes designed to assist them.

71. Often, programmes are put in place that rely on the participation of these peoples but fail to provide effective financial, material and institutional arrangements needed for the programmes' success. Instead of becoming beneficiaries, they become the victims of development. Focusing on the human side of development attempts to integrate the marginalized peoples into the decision-making process so that it can transform their condition. Making the programmes a success will require the political will to make domestic changes, implementation of appropriate policy and institutional changes and the commitment from the international community to alleviate some of the more pressing economic constraints holding back development.

72. To achieve compatible human and water resources development reforms need to be undertaken in a number of areas.

Poverty

73. Water resources planning should focus on the relationship between water and poverty in urban and rural areas. As asserted in Agenda 21, "a specific anti-poverty strategy is therefore one of the basic conditions for ensuring sustainable development". 19/ Addressing poverty is also essential in developing the capability in people to use productively and conservatively the water resources available to them.

Human development

74. Water resources planning and management should become more people centred. Priority must be given to understanding the needs and capabilities of the target populations and providing the training, incentives, backup services, institutional support and financial resources needed to involve people more effectively in the proposed developments.

75. Responding to the needs and interests of the people should be the key organizational element to "bottom-up" human development planning, as well as being essential for ensuring success in more traditional-directed planning efforts. As chapter 18 of Agenda 21 emphasizes, this involves the strengthening of the functioning of Governments in water resources planning and, at the same time, giving full recognition to the role of local authorities and community-based organizations in this process. 20/ In the end, water resources planning and development should be based on a broad participation approach, involving users, planners and policy makers at all levels.

76. Emphasis should be given to public health in both urban and rural areas where the lack of clean water and good sanitation imposes a health handicap.

Research

77. Greater efforts need to be made to determine the real value of women's contribution to the water economy of poor rural and urban areas and to develop gender-sensitive research on the role of women in the management and conservation of water resources and the impact on them of environmental degradation, desertification and excessive use or misuse of water.

78. Similarly, research should be encouraged on the traditional water and land use practices of indigenous groups to determine how or whether they can be adapted in promoting human and water resources development.

Participation

79. Public participation should be a fundamental aspect of water planning. It is essential to recognize that people must be the agents of change in promoting their own development and that they cannot be effective unless they have the opportunity to participate and influence the process that will bring about change.

80. Efforts should be made to identify the informal as well as the formal groups affected by water development. Women's groups could be overlooked if the effort is not made to identify and encourage their participation, which could be essential for success in the implementation of programmes for urban and rural water supply and sanitation, and agricultural water projects.

81. The participation of traditional and local groups should be incorporated in any water planning or land use changes that may affect them. Their practical experience and support are necessary to successful planning.

82. Given that water has value and development of the resource will entail significant distributional considerations, provisions for public participation should include mechanisms for dispute resolution.

Environment

83. Water resources development should take fully into account the fact that water is central to ecological systems and, in its natural state, water resources are vital to the preservation of wetlands, other environmental and amenity values and traditional lifestyles.

Subsidies and cost recovery

84. The uses of subsidies for water projects should be considered carefully to avoid the wasteful use of water and scarce investment funds. They should only be applied when the social benefits to society are greater than to the individual.

85. Price controls and subsidies for food should not reduce the cost of domestic foodstuffs to a level at which there is no longer a price incentive for the farmer to produce for the market or to invest in more intensive production.

86. To the extent possible, investments in water should be recovered through taxes and user fees so as to avoid dependence on continuing government subsidization for payment of recurrent costs and to ensure the water projects are self-sustaining.

87. It is important to recall the emphasis that the International Conference on Water and the Environment gave to the concept of water as an economic good. In this regard, both the Conference and Agenda 21 noted that:

> "Planning considerations should reflect benefits investment, environmental protection and operation costs, as well as the opportunity costs reflecting the most valuable alternative use of water. Actual charging need not necessarily burden all beneficiaries with the consequences of those considerations. Charging mechanisms should, however, reflect as far as possible both the true cost of water when used as an economic good and the ability of the community to pay." 21/

Water rights

88. A stable yet flexible system of water rights, whereby rights can be assigned and transferred to individuals as well as to customary users and collective groups, should be a goal.

National water plans

89. A national water action plan should be implemented that reflects the view of the people and can serve as a framework for allocating water among sectors, identifying training, technical and financial needs, and serving as the basis for negotiating development assistance. The plan should be implemented in coordination with the formulation of sustainable development strategies.

Organization

90. The institutional setting for the formulation of a national water policy should be separated from those organizations responsible for implementation and delivery. The arrangements should ensure that no one sectoral organization can appropriate water to the detriment of achieving an optimal allocation of water within a country.

91. As much as feasible, water delivery should be devolved to the regional and local level with the participation of local user groups. The use of local volunteer organizations and non-governmental organizations should also be considered as a means to work effectively at the local level.

92. Given that water is integral to environmental considerations, water policy-making and monitoring should be done in coordination with the agencies responsible for environmental policy.

Macroeconomic and structural adjustment policies

93. Appropriate levels of financial and institutional support should be made available where water resources investments are essential to achieve basic levels of human health, to meet medium- and long-term development goals or to sustain fragile environmental resources.

Development assistance

94. Working out appropriate institutional arrangements will help in promoting human development and in making for more successful water development. It is apparent, however, that many of the poorest countries start from a level in which financial resources and skills are not available. The situation a number of countries face, that of a net exporter of capital to meet debt obligations, makes the situation even more desperate. Clearly, most developing countries need some forms of assistance to initiate the process of reform and development. Instead, they face the obstacles of debt and a reluctance of many of the more wealthy countries to commit more of their own resources to official development assistance. Overall, they are committing about 0.3 per cent of their gross domestic product to such assistance. Agenda 21 calls for a commitment of 0.7 per cent. Innovative assistance strategies need to be developed to boost necessary investments in water and associated human development programmes. Consideration should be given to debt forgiveness, enhanced bilateral assistance programmes and strengthening multilateral financial and technical programmes.

95. What is most needed from external support agencies, including development banks and multilateral agencies, is long-term reliable funding, especially for human development, institution building and research, as they are essential for the success of the implementation and operation of water resources development projects. This implies shifting focus away from short-term, physical projects primarily aimed at creating opportunities for contractors and manufacturers in recipient countries. Greater priority should also be given to technical assistance designed to strengthen local capabilities and to provide appropriate technologies, as opposed to the more common capital-intensive and advanced technology assistance.

Notes

1/ World Commission on Environment and Development, Our Common Future (Oxford, Oxford University Press, 1987), p. 43.

2/ United Nations, Department of Technical Cooperation for Development, Demand Management, paper prepared for the International Conference on Water and the Environment, p. 9.

3/ See Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992 (A/CONF.151/26/Rev.1), vol. I, chap. 3.

4/ United Nations Development Programme, Human Development Report, 1990 (Oxford, Oxford University Press, 1990), p. 32.

5/ World Bank, World Development Report, 1992 (Oxford, Oxford University Press, 1992), box 4.6, p. 94.

Notes (continued)

6/ Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977 (United Nations publication, Sales No. E.77.II.A.12), chap. I, p. 3.

7/ Morris Miller, Debt and the Environment: Converging Crises (United Nations publication, Sales No. E.91.I.17), p. 70.

8/ World Bank, World Development Report, 1992 ..., p. 104.

9/ Ibid., p. 69.

10/ Ibid., p. 95.

11/ Ibid., pp. 93-94.

12/ Ibid., p. 96.

13/ Ibid., p. 81.

14/ Ibid., p. 106.

15/ Ibid., p. 68.

16/ Ibid., p. 89.

17/ Ibid.

18/ United Nations, Department of Technical Cooperation for Development, Integrated Water Resources Planning, paper prepared for the International Conference on Water and the Environment, p. 6.

19/ See Report of the United Nations Conference on Environment and Development ..., vol. I, chap. 3.

20/ Ibid., chap. 18.

21/ Ibid., para. 18.16.